units) was chosen so that any benefit could be clearly demonstrated. Most patients had been on much higher doses previously. It is interesting that the significant reduction in steatorrhoea caused only a small and insignificant decrease in faecal wet weight and stool frequency which may reflect the low dosage used. The use of positioned-release capsules (whatever their mode of action may be) to deliver enzyme supplements resulted, however, in a significant reduction in steatorrhoea.

Pancreatin BPC in Duocaps and control gelatine capsules was supplied by Biorex Laboratories Ltd, London N1, whose help we gratefully acknowledge.

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Unusual presentation of anorectal carcinoma

Ischiorectal abscesses are common and require hospital admission for incision and drainage under general anaesthesia. Their association with an underlying carcinoma in the rectum or anal canal has not been previously reported and we describe two cases which illustrate this association.

Case reports

Case 1—A 58-year-old woman was admitted to hospital with a two-day history of pain in the perianal region that was becoming progressively more severe. Examination revealed a hot tender swelling of the left ischiorectal fossa. She had a fever (38·7°C) and her white cell count was $13{\cdot}8\times10^9$/l. Under general anaesthesia a deeply sited ischiorectal abscess cavity was deroofed. Digital examination of the anal canal showed an indurated posterior wall from which a biopsy sample was taken. Histological examination showed a moderately differentiated squamous-cell carcinoma.

Case 2—A 63-year-old man was admitted to hospital with a right ischiorectal abscess. He had noted a change in bowel habit in the previous few months. He had no fever and had a white cell count of $13{\cdot}3\times10^9$/l. The abscess was deroofed, and rectal examination under the anaesthetic revealed an ulcerating lesion at 6 cm on the right lateral wall. Biopsy confirmed that this was an adenocarcinoma.

Comment

Carcinoma of the colon may present as an abdominal wall abscess, due to the direct spread of the colonic neoplasm to the anterior abdominal wall.[1] Posterior perforation may occur and present as a retroperitoneal abscess.[2] A left perinephric abscess has been described as the presenting feature in cases of carcinoma of the descending colon.[3] Squamous-cell carcinoma of the anal canal presenting as a groin abscess which complicated metastatic lymph nodes has been described in two cases.[4] Carcinoma complicating an anal fistula is well recognised, though most anorectal abscesses are not associated with anal fistula[5] and fistulas were not found in our patients.

Our experience emphasises the need to perform a thorough local examination at the time of incision of an anorectal abscess with biopsy of any suspicious lesions.

Requests for reprints should be addressed to Mr I A Donovan.

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Tetanus after allogeneic bone-marrow transplantation

We report a case of tetanus, an uncommon medical emergency, after allogeneic bone-marrow transplantation complicated by radiation-induced pneumonitis.

Case history

A 30-year-old army sergeant received a bone-marrow transplant from his brother who showed HLA and mixed-lymphocyte-culture compatibility, for the treatment of a granulocytic sarcoma after local radiotherapy to the presenting tumour mass.[1] Six years earlier he had sustained an open, compound fracture of the left tibia and fibula while on army exercises. A pin and plate had been inserted after several hours' delay. At the time booster anti-tetanus and benzylpenicillin had been administered and union subsequently achieved.

Bone-marrow transplantation was performed after he had received cyclophosphamide 120 mg/kg and total body irradiation. Cyclosporin A was given as prophylaxis against graft-versus-host disease.[2] Engraftment was achieved, and two episodes of graft-versus-host disease were controlled by infusions of methylprednisolone. On day 54 after transplantation a coarse tremor developed and over 24 hours dysarthria, dysphagia, and abdominal cramps ensued. Painful muscular twitchings and increased extensor tone were present. Clonic spasms precipitated by examination, in association with trismus and a reduced dental gap, were noted. Tetanus was diagnosed clinically. Treatment included sedation with diazepam 30 mg intravenously, benzylpenicillin 2 MU four-hourly, and 1250 U human antitetanus immunoglobulin. Assisted ventilation was required, and one episode of hypertension occurred but required no active treatment. Despite intensive measures progressive hypoxia developed in association with acute renal failure. Sustained hypotension and bradycardia developed and he died 14 days after the onset of tetanic symptoms.

Necropsy disclosed radiation-induced pneumonitis and widespread hypoxic changes throughout the cerebral cortex. Acute tubular necrosis was seen in the kidneys. No organisms were cultured from the lungs or the site of the old fracture around the pin and plate.

Comment

Tetanus is an uncommon medical emergency that has a good prognosis for full recovery provided that it is diagnosed.[3] The patient reported on here would have received full immunisation against *Clostridium tetani* during his active service, and we postulate that the immunosuppression used for bone-marrow transplantation eradicated this immunity. No spores or bacilli of *Cl tetani* were found at the old fracture site, but it is possible that dormant spores may reside in the body for long periods. We suggest that spores were incorporated into the wound site before surgery and that oxygenation to the tissues around the plate became compromised after transplantation, permitting

germination of dormant spores. Radiation may possibly have damaged the microvasculature in the area of the plate by electron scatter.

Postmortem studies showed radiation-induced pneumonitis. Sufficient reduction in the oxygen tension may have occurred to prejudice oxygenation of the tissues around the plate before clinical hypoxia was recognised. Prolonged immunosuppression is seen after bone-marrow transplantation, and cyclosporin A may have prevented an immune response by donor lymphocytes.

With the increasing use of highly immunosuppressive regimens for allogeneic and autologous marrow transplantation we suggest that such complications may be seen more frequently. In retrospect, careful attention to the patient's history and the use of prophylactic penicillin and passive immunisation might have been beneficial.

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Recurrent hyperinfestation with Strongyloides stercoralis in a renal allograft recipient

A renal allograft recipient who became hyperinfested with *Strongyloides stercoralis* after unsuccessful live donor transplantation had a fatal recurrent hyperinfestation after subsequent cadaveric transplantation despite repeated courses of treatment with thiabendazole. Indiscriminate prophylaxis with thiabendazole of transplant recipients from endemic areas may therefore be ineffective and undesirable.

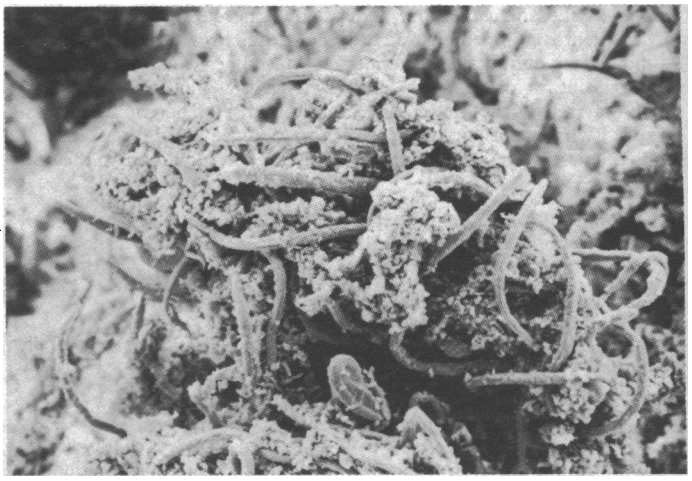
Case report

A 45-year-old Iranian man had a severe rejection one month after live donor renal transplantation. He was treated vigorously with methylprednisolone (1 g intravenously on three successive days), an increase in his dose of oral prednisolone (to 150 mg initially reducing to 50 mg over six days), and the addition of cyclophosphamide 25 mg daily to his immunosuppressive regimen of azathioprine and prednisolone. The rejection was contained, but three weeks later he presented with fever, rigors, and prostration, which suggested a Gram-negative septicaemia. Intravenous fluid replacement and broad spectrum antibiotics, however, failed to improve his condition. He remained ill until hyperinfestation with *S stercoralis* was diagnosed when rhabditiform larvae of the nematode were identified in his urine and stools. The only previous evidence of infestation was a transient eosinophilia of 26% on one occasion before transplantation.

Two three-day courses of thiabendazole 1·5 g twice daily were needed before the parasite was eradicated from the stool. The pyrexia persisted until *Streptococcus faecalis* was isolated from blood culture and treated appropriately.

The transplanted kidney failed over the succeeding four months and he was returned to intermittent haemodialysis. Repeated stool examinations failed to show persistence of the worm and there was no eosinophilia. Sixteen months after the first transplant he was given a second graft from a cadaveric donor. *S stercoralis* was again identified in the stool postoperatively but was eradicated by a further three-day course of thiabendazole 1·5 g twice daily.

The transplanted kidney functioned well but six weeks later he returned with a troublesome dry cough and profound malaise. Physical examination and chest *x*-ray films initially showed no abnormality but the illness progressed catastrophically over a few hours with the onset of severe dyspnoea and diffuse abdominal tenderness. A repeat chest *x*-ray film then showed patchy bilateral opacification. Soon afterwards he had a cardiorespiratory arrest. He was resuscitated and ventilated but then developed copious frothy haemoptysis and died.



Scanning electron micrograph of filariform larvae on mucosal surface of duodenum (×321 magnification).

Necropsy showed an extensive bilateral pneumonitis due to *S stercoralis* with larval forms of the organism distributed throughout the body (figure).

Comment

Hyperinfestation with *S stercoralis* may occur when a chronic duodenal carrier of the worm becomes debilitated or immunosuppressed.[1 2] It is a well-recognised complication of renal transplantation in patients who originate from warm climates where the nematode is endemic.[3 4] It has been suggested that all such patients at risk should receive prophylactic treatment with thiabendazole.[4]

This man developed fatal disseminated strongyloidiasis despite treatment with thiabendazole after a previous episode of hyperinfestation and again after the second transplant. Clearly, in the conventional doses used here the drug was not effective prophylaxis against the worm.

The use of higher doses or longer courses of thiabendazole for prophylaxis increases the likelihood of adverse effects from thiabendazole. This risk does not seem justified when hyperinfestation after transplantation is uncommon even in patients from endemic areas; this case is the only one in our experience of more than 200 such patients. We recommend that prophylaxis be reserved for those patients in whom there is preoperative evidence of carriage of the organism such as unexplained eosinophilia or a history of symptomatic infestation. In these patients prolonged and repeated courses of thiabendazole are clearly appropriate. After transplantation frequent stool examinations and a keen awareness of the likelihood of hyperinfestation still give the best hope of early diagnosis and effective treatment.

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